

REMARKS

In reply to the Office Action dated February 27, 2002, the foregoing amendments were made to overcome the objections to the specification, Abstract, and Drawings. Claim 1 was amended to more appropriately describe and claim the invention. Dependent claim 18 was added to protect additional aspects of the invention. Applicants submit that these amendments add no new matter.

In the Office Action, the Examiner objected to the Specification, Abstract, and Drawings. The Examiner rejected claims 13 and 17 under 35 U.S.C. § 112, first paragraph and also rejected claims 1-17 under 35 U.S.C. § 112, second paragraph. The Examiner rejected claims 1 and 7-10 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,663,743 to *Fujii et al.*, in view of U.S. Patent No. 3,956,661 to *Sakamoto et al* and rejected claims 11-12 under 35 U.S.C. § 103(a) as unpatentable over *Sakamoto* and *Fujii*, and further in view of *The Electrical Engineering Handbook*, CRC Press, 1993, p. 545. The Examiner rejected claims 2-4 and 14-15 under 35 U.S.C. § 103(a) as unpatentable over *Sakamoto* and *Fujii*, and further in view of U.S. Patent No. 6,121,943 to *Nishioka*. The Examiner rejected claims 5 and 6 under 35 U.S.C. § 103(a) as unpatentable over *Sakamoto* and *Fujii*, and further in view of U.S. Patent No. 6,236,394 B1 to *Ikeda*. The Examiner further rejected claim 16 under 35 U.S.C. § 103(a) as unpatentable over *Sakamoto*, *Fujii*, and *Nishioka*, and further in view of *The Electrical Engineering Handbook*. The Examiner rejected claim 13 under 35 U.S.C. § 103(a) as unpatentable over *Sakamoto* and *Fujii*, and further in view of U.S. Patent No. 5,473,289 to *Ishizaki et al.* The Examiner rejected claim 17 under 35 U.S.C. § 103(a) as unpatentable over *Sakamoto*, *Fujii*, and *Nishioka*, and further in view of *Ishizaki*.

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The Examiner objected to the specification for containing minor informalities. Applicants have amended the specification to eliminate the minor informalities identified by the Examiner. Based on the foregoing remarks Applicants submit that the Examiner's objection to the specification is moot and should be withdrawn.

The Examiner objected to the Abstract because it exceeded 150 words and contained language comparing the claimed invention to the prior art. Applicants have amended the Abstract so that it conforms to the requirements set forth in 37 C.F.R. § 1.72(b). As a result, Applicants submit that the Examiner's objection to the Abstract should be withdrawn.

The Examiner objected to the drawings for failing to properly mark Figures 1 and 2 as "Prior Art." In a Request for Approval of Drawing Changes submitted herewith, Applicants have proposed amending the drawings to include the Prior Art legend, and requests that the Examiner approve these changes. Applicants will submit new formal drawings upon allowance of the application.

The Examiner rejected claims 13 and 17 under 35 U.S.C. § 112, first paragraph for containing subject matter not described in the specification in a way to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicants respectfully traverse this rejection.

The Examiner alleges that the specification provides a bipolar transistor as an example of an amplifying device, but fails to describe how an operational amplifier can also be used as an amplifying element. Specifically, the Examiner alleges that the specification fails to describe which terminal of the operational amplifier corresponds to

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the control terminal and how the operational amplifier would be incorporated into the circuit as recited in claims 1 and 2. Applicants respectfully disagree.

Applicants submit that one of ordinary skill in the art would in fact be able to make or use the invention based on the current disclosure. The Examiner's allegation assumes that all operational amplifiers are constrained to have at least two input terminals and one output terminal. One of ordinary skill is aware that an operational amplifier is comprised of, among other things, a number of interconnected transistors. Based on the configuration of the interconnected transistors and the application, it is common knowledge in the art that an operational amplifier may, in fact, have one input. Therefore, given all other elements in the circuit, one of ordinary skill in the art could properly connect the terminals of the operational amplifier without undue experimentation. "Those who must be enabled by the specification are those skilled in the art, not the general public at large. Accordingly, it is not necessary to include in the specification either what is well-known in the art." *Lindemann Maschinenfabrik v. American Hoist & Derrick Co.*, 730 F.2d 1452 (Fed Cir. 1984). "The fact that some experimentation may be necessary to make or use the invention does not render the specification nonenabling. The dispositive inquiry is whether the amount and nature of the experimentation are reasonable." *White Consolidated Industries v. Vega*, 713 F.2d 788 (Fed Cir. 1983).

Furthermore, Applicants submit that although the manner of connecting an operational amplifier in a circuit may be well known, the circuit as recited in the claim is novel and nonobvious. Based on at least these reasons, Applicants submit that the

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Examiner's rejection of claims 13 and 17 under 35 U.S.C. § 112, first paragraph should be withdrawn.

The Examiner rejected claims 1-17 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicants have amended independent claim 1 to more appropriately recite the invention. Therefore, the Examiner's rejection of claims 1-17 under 35 U.S.C. § 112, second paragraph is moot, and should be withdrawn.

Applicants traverse Examiner's rejection of independent claim 1 under 35 U.S.C. § 103(a) because the Examiner fails to establish a *prima facie* case of obviousness.

The Examiner rejected claim 1, under 35 U.S.C. § 103(a) as unpatentable over *Fujii* in view of *Sakamoto*. However, to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), each of three requirements must be met. First, the references, taken alone or combined, must teach or suggest each and every element recited in the claims. See M.P.E.P. § 2143.03 (8th ed. 2001). Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, the basis for obviousness must "be found in the prior art, and not based on applicant's disclosure." M.P.E.P. § 2143 (8th ed. 2001).

Independent claim 1 recites a data driver power circuit comprising, among other things, a diode group including a plurality of series-connected diodes wherein a cathode terminal of a first diode is connected to ground and an anode terminal of a last diode is connected to said control terminal of said amplifying element, and each other diode in

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the series having a cathode terminal connected to an anode terminal of the preceding diode, and a capacitor having a first terminal connected to the output terminal of the amplifying element and a second terminal connected to ground.

In contrast, *Fujii* and *Sakamoto*, either singly or together, fail to teach or suggest at least a capacitor as recited in the claim. According to an embodiment of the invention a capacitor serves to stabilize the data drive voltage, thus enabling the claimed invention to realize, at the same time, a voltage regulation function, a temperature compensation function, and a power supply function for the liquid crystal display device.

Furthermore, Applicants submit that the combination of *Sakamoto* further fails to teach or suggest a diode group as recited in the claims. The Examiner acknowledges that *Fujii* does not teach the claimed diode group and relies on *Sakamoto* to remedy this deficiency. *Sakamoto*, however, teaches that the number of diodes *m* is determined by considering the relationship between the output voltage and the source voltage. Based on this teaching, *Sakamoto* is limited to connecting a maximum of two diodes in series. In fact, when compensating for temperature variations and variations in load voltage, Figures 2, 3, 7, and 8 of *Sakamoto* illustrate connecting no more than two diodes in series. Therefore, *Sakamoto* does not teach or suggest the diode group as claimed and further lacks motivation to combine its teachings with *Fujii* to achieve the claimed results.

Because the combination of *Fujii* and *Sakamoto* fails to teach every element of the claimed invention and further lacks motivation for their combination, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness. Thus, the rejection of claim 1 under 35 U.S.C. §103 should be withdrawn.

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Because claims 2-18 depend from independent claim 1, Applicants submit that claims 2-18 are allowable for at least the reasons stated in the discussion above by virtue of their dependency on claim 1.

In view of the foregoing remarks, Applicants respectfully request the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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APPENDIX TO AMENDMENT OF JULY 29, 2002

Version with Markings to Show Changes Made

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Amendments to the Specification

Page 1, replace the paragraph beginning on line 20 with the following new paragraph:

Further, reference characters 502 and 504 denote resistors. Reference character [504,] 503, 505, 506, and 507 respectively designate a variable resistor, a diode group, a transistor, and a data drive voltage for driving a data drive circuit of the liquid crystal display device. Reference characters 508 and 509 denote capacitors. The resistor 502, the variable resistor 503, the resistor 504, and the diode group 505 are connected in series in this order. A terminal of the upper resistor 502 is connected to the input power supply 501. A cathode of the diode group 505 is connected to the ground.

Page 8, replace the paragraph beginning on line 9 with the following new paragraph:

Further, reference character 102, 103, 104, and 105 designate a resistor, a transistor, a diode group, and a data drive voltage for driving a data drive circuit of a liquid crystal display device, respectively. Reference characters 106 and 109 denote junctions. Reference characters 111 and 112 designate capacitors. The resistor 102 and the diode group 104 are connected in series at a junction 109. A terminal of the

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resistor [104] 102 is connected to a junction 106 that is connected to an input power supply 101. A cathode of a diode group [505] 104 is connected to the ground.

Amendments to the Claims

1. (Amended) A power supply circuit, which has a scan driver power circuit for supplying a scan drive voltage to a scan driver for scanning a liquid crystal display device, and which has a data driver power circuit for supplying a data drive voltage to a data driver for sending display data to said liquid crystal display device, said data driver power circuit comprising:

an input power supply serving as a universal power supply therefore;

an amplifying element having an input terminal connected to said input power supply, and having a control terminal, and an output terminal from which the data driver power voltage is outputted;

an electric current limiting resistor having a first terminal connected to said input power supply, and having a second terminal connected to said control terminal of said amplifying element; [and]

a diode group including a plurality of series-connected diodes [each having a cathode terminal connected to said control terminal of said amplifying element, and having an anode terminal connected to the ground] wherein a cathode terminal of a first diode is connected to ground and an anode terminal of a last diode is connected to said control terminal of said amplifying element, and each other diode in the series having a cathode terminal connected to an anode terminal of the preceding diode; and

a capacitor having a first terminal connected to said output terminal of said amplifying element, and a second terminal connected to ground.

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Amendments to the Abstract

[A conventional power supply circuit has drawbacks in that the fine adjustment of a data driver power supply voltage cannot be achieved and that the range of a data drive voltage changes with production variations in an input power supply. These drawbacks are caused owing to the fact that the operating range thereof is increased so as to compensate for a change in the range which is brought about according to a temperature characteristic of a liquid crystal used in a liquid crystal display device. The present invention provides a power supply circuit that eliminates these drawbacks. The]

A power supply circuit [of the present invention comprises] having a data driver power circuit, which has a temperature compensation function and a voltage regulation function, and [also comprises] a scan driver power circuit that has a function of controlling the brightness of the liquid crystal display device as a user desires. The data driver power circuit of the power supply circuit [of the present invention] has a diode group and an electric current limiting resistor so that the data drive voltage is 3.6 V or so at room temperature.

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